

# **International Journal of Biometeorology**

**Journal of the International Society of Biometeorology**

edited by

W. H. Weihe  
Editor-in-Chief

S. W. Tromp  
Managing Editor

R. W. Gloyne  
Assistant Editor

**U. of ILL. LIBRARY**

**MAY 8 - 1972**

**CHICAGO CIRCLE**

**VOLUME 15**

**1971**

Published by N.V. Swets & Zeitlinger, Amsterdam



## CONTENTS OF VOLUME 15

NUMBER 1 - March 1971

In Memoriam Doctor Hugo Boyko	1
Doctor Honoris Causa of Professor James D. Hardy	3
The Course of Experimental Influenza in Mice Maintained in High Concentrations of Small Negative Air Ions. A. P. Krueger, S. Kotaka and E. J. Reed	5
Effect of the Presence of Man on the Air Ion Density in an Office Room. B. Maczyński, S. Tyczka, B. Marecki and T. Góra	11
The Relationship Between Weather and Mortality in Ten Major Metropolitan Areas in the United States, 1962-1965. D. M. Driscoll	23
Comparison of the Comfort Conditions in Different Urban and Suburban Microenvironments. J. F. Clarke and W. Bach	41
Effects of a High Fat Diet on Thyroid Activities, with special Reference to Thyroidal Responses to Cold. A. Kuroshima, K. Doi and S. Itoh	55
A High Incidence of Jaagsiekte Following Experimental Cold Exposure in Housed Sheep. J. M. K. Mackay, D. I. Nisbet and J. Slee	65
Seasonal Variations in the Conception Rate of Beef Cattle in the Seasonal-Equatorial Climate of Southern Nigeria. J. Steinbach and A. A. Balogun	71

## Reports and News

Third Symposium on Environmental Physiology at the Negev Institute for Arid Zone Research, Beer-Sheva, Israel, 19-20 October 1970; Symposium on the Adaptation of Man and Animals to Extreme Natural Environments, Novosibirsk, USSR, 12-17 October 1970	81
--	----

## NUMBER 2, 3, 4 - December 1971

Proceedings of Volunteered Papers of the  
Symposium on Temperature Regulation  
Dublin, Ireland, 18-23 July 1971  
Organized by R. E. Moore  
Edited by S. W. Tromp and W. H. Weihe

Foreword. R. E. Moore	101
Thermoregulatory Efficiency of Neonatal Rabbit Search for Fur Comfort Contact. E. Jeddi	105
Spatial Summation in Relation to the Dynamics of Warmth Sensation. L. E. Marks	106
Spatial Summation in Relation to Speed of Reaction to Radiant Stimulation. J. C. Stevens and W. P. Banks	111
Diurnal Activity in a Small Desert Rodent. A. Shkolnik	115

Evaluation of some Controller Inputs to Behavioral Temperature Regulation. Eleanor R. Adair	121
Interactions Between the Thermoregulatory Responses to Injections into a Lateral Cerebral Ventricle of the Welsh Mountain Sheep of Putative Neurotransmitter Substances, and of Local Changes in Anterior Hypothalamic Temperature. M. Maskrey and J. Bligh	129
Mechanism of Cellular Thermoreception in Mammals. F. K. Pierau, M. R. Klee, D. S. Faber and F. W. Klussmann	134
A Feedback-Feedforward Mechanism Describing the Interaction of Central and Peripheral Signals in Human Thermoregulation. C. E. Huckaba, J. A. Downey and R. C. Darling	141
Spinal Cord and Hypothalamus as Parallel Core Sensors of Temperature in the Dog. C. Jessen	146
Metabolic Heat Balance Data for 24-Hour Periods. P. Webb	151
Interaction of Superficial and Hypothalamic Thermosensitive Structures in the Control of Non-Shivering Thermogenesis. K. Brück and H. P. Schwennicke	156
Sympathetic Control of Substrates and Thermogenesis During Central Cooling. C. C. Gale, K. Muramoto, P. T. K. Toivola and D. Stiner	162
The Effect of Skin and Central Cooling on Human Thermoregulation. J. A. Downey, C. E. Huckaba and R. C. Darling	171
Effect of Environment on Temperatures in the Viscera of the Dog. J. Grayson and A. O. Durotoye	176
Simulating the Thermal Response of a Working Man with a Computer. A. R. Atkins and D. Mitchell	183
Sweating and Body Temperatures During Exercise. B. Saltin and A. P. Gagge	189
Thermoregulation in Exercising Man During Dehydration and Hyperhydration with Water and Saline. B. Nielsen, G. Hansen, S. O. Jorgensen and E. Nielsen	195
Control of Local and Total Sweating During Exercise Transients. E. R. Nadel, J. W. Mitchell and J. A. J. Stolwijk	201
Correlations Between Input and Output of the Thermoregulatory Control System During Rest and Exercise. J. Kitzing, K. Behling, A. Bleichert, S. Ninow, M. Scarperi and S. Scarperi	207
An Analog Model of Thermoregulation During Rest and Exercise. K. Behling, A. Bleichert, J. Kitzing, S. Ninow, M. Scarperi and S. Scarperi	212
Regional Differentiation of Vasomotor Activity Underlying Thermoregulatory Adjustments of Blood Flow. E. Simon	219
Periodic Elevations of Blood Pressure of Cattle During Exposure to Subzero Environmental Temperatures. J. D. Olsen	225
Thermoregulatory Responses to Hypoxia and Hypercapnia in the New Born Rat, Rabbit and Guinea Pig. S. Donhoffer, Ilona Várnai and Maria Farkas	226
CNS Regulation of Body Temperature in the Hibernator <i>CITELLUS LATERALIS</i> . H. C. Heller and H. T. Hammel	231

peripheral Sensitivity and Temperature Regulation in TILQUA SCINCOIDES. H. P. Cabanac and H. T. Hammel	239
ome Aspects of Thermoregulation in the White Leghorn Fowl. M. van Kampen	244
heat Transfer and Body Temperature in the Atlantic Bottlenose Dolphin, TURSIOPS TRUNCATUS. I. F. G. Hampton, G. C. Whittow, J. Szekerczes and S. Rutherford	247
interactions of Hypothalamic Thermosensitivity and Body Size in Vertebrates. J. E. Heath, B. A. Williams and S. H. Mills	254
The Evolution of Thermoregulatory Sweating in Man and Animals. D. Robertshaw	263
Iodification of Central Sweating Drive at the Periphery. J. A. J. Stolwijk, E. R. Nadel, J. W. Mitchell and B. Saltin	268
local Determinants of Sweating and the Assessment of the "Set Point". R. S. Elizondo and R. W. Bullard	273
Sweating and Panting in Welsh Mountain Sheep. K. G. Johnson	281
actors Determining the Sweating Threshold. G. W. Crockford, K. P. Foster and J. Haspineall	286
Diagrammatic Representation of Adrenalin Sweating in Human Eccrine Sweat Glands. K. Ikai and Y. Hasegawa	292
noradrenergic Mechanism in the Central Control of Body Temperature. W. I. Cranston, R. F. Hellon, R. H. Luff and M. D. Rawlins	301
omparison of the Effects of Local Hypothalamic Acetylcholine and RF-Heating on Non-Shivering Thermogenesis in the Guinea Pig. E. Zeisberger and K. Brück	305
single Unit Responses to Temperature Change in the Brain of Newborn Rabbits. Theresa C. Henderson, R. G. Luckwill and T. Nayernouri	309
Central Synaptic Interference and Experimental Fever. J. Frens	313
entral Effects of Chemical Transmitters on Temperature Regulation in the Adult Rat and the Newborn Guinea Pig. Maria Farkas and I. Komáromi	316
Means of Noradrenalin Action During Non-Shivering Thermogenesis in a Single Muscle. J. Mejsnar and L. Jansky	321

#### ANNEX

peripheral Vascular Responses to Heat Stress in Elderly Men. W. H. Fennell and R. E. Moore	325
cclimatization to Cold in House Mice Living on an Island. M. E. Jacobson	330
ermoregulatory Efficiency of Neonatal Rabbit Search for Fur Comfort Contact. E. Juddi	337
ermogenic Properties of Norfenfluramine. D. San-Yi, J. F. Andrews and R. E. Moore	342
xperimental Hyperthermia in Traumatic Quadriplegia. G. L. Totel, R. E. Johnson, F. A. Fay, J. A. Goldstein and J. Schick (Study Group 4)	346
behavioural Thermoregulation in Single and Mice with Change of Cooling Power of the Air. W. H. Weihe	356

## AUTHOR INDEX

- Adair, E.R. 103, 121  
 Andrews, J.F. 217, 342  
 Atkins, A.R. 181, 183  
 Bach, W. 41  
 Balogun, A.A. 71  
 Banks, W.P. 103, 111  
 Baumann, I. 217  
 Behling, K. 181, 207, 212  
 Belaiche, R. 103  
 Bleichert, A. 181, 207, 212  
 Bligh, J. 127, 129  
 Breull, W. 103  
 Brück, K. 149, 156, 299, 305  
 Bullard, R.W. 261, 273  
 Burton, R.R. 237  
 Cabanac, H.P. 237, 239  
 Cabanac, M. 103  
 Clark, J.F. 41  
 Cohn, F. 169  
 Cranston, W.I. 299, 301  
 Crockford, W.G. 259, 261, 286  
 Crowley, G.J. 237  
 Darling, R.C. 127, 141, 169, 171  
 Doi, K. 55  
 Donhoffer, S. 217, 226, 299  
 Downey, J.A. 127, 141, 169, 171  
 Driscoll, D.M. 23  
 Durotoye, A.O. 169, 176  
 Edholm, O.G. 169  
 Elizondo, R.S. 261, 273  
 Faber, D.S. 127, 134  
 Farkas, M. 217, 226, 299, 316  
 Fay, F.A. 169, 346  
 Fennell, W.H. 169, 325  
 Foster, K.G. 261, 286  
 Frens, J. 299, 313  
 Gagge, A.P. 181, 189  
 Gale, C.C. 149, 162  
 Goldstein, J. 169, 346  
 Góra, T. 11  
 Grayson, J. 169, 176  
 Hammel, H.T. 217, 231, 237, 239  
 Hampton, I.F.G. 237, 247  
 Hansen, G. 181, 195  
 Hardy, J.D. 127  
 Hasewaga, Y. 261, 292  
 Haspineall, J. 261, 286  
 Heath, J.E. 237, 254  
 Heller, H.C. 217, 231  
 Hellon, R.F. 299, 301  
 Hellstrom, B. 181  
 Henderston, T.C. 299, 309  
 Houdas, Y.  
 Huckaba, C.E. 127, 141, 169, 171  
 Iggo, A. 127  
 Ikai, K. 261, 292  
 Itoh, S. 55  
 Jakobson, M.E. 217, 330  
 Jansky, L. 299, 321  
 Jeddi, E. 103, 105, 337  
 Jessen, C. 127, 146, 149  
 Johnson, H.L. 217  
 Johnson, K.G. 261, 281  
 Johnson, R.E. 169, 346  
 Johnson, R.H. 169  
 Jorgensen, S.O. 181, 195  
 Kitzing, J. 181, 207, 212  
 Klee, M.R. 127, 134  
 Klussmann, F.W. 127, 134  
 Komaromi, I. 299, 316  
 Kotaka, S. 5  
 Krueger, A.P. 5  
 Krzywicki, H.J. 217  
 Kuroshima, A. 55  
 Lee, S. 259  
 Lindsey, W.D. 217  
 Litman, M. 259  
 Luckwill, R.G. 299, 309  
 Luff, R.H. 299, 301  
 Mackay, J.M.K. 65  
 Mackzyński, B. 11  
 Maloij, G.M.O. 237  
 Marecki, B. 11  
 Marks, L.E. 103, 106  
 Maskrey, M. 127, 129  
 Massonnet, B. 103  
 Mejsnar, J. 149, 299, 321  
 Meltzer, A. 237  
 Mills, S.H. 237, 254  
 Mitchell, D. 181, 183  
 Mitchell, J.W. 181, 201, 261, 268  
 Moore, R.E. 103, 169, 217, 325, 342  
 Muramoto, K. 149, 162  
 Myhre, K. 181  
 Nadel, E.R. 181, 201, 261, 268  
 Mayernouri, T. 299, 309  
 Nielsen, B. 181, 195  
 Nielsen, E. 181, 195  
 Ninow, S. 181, 207, 212  
 Nisbet, D.I. 65  
 Olsen, J.D. 217, 225  
 Park, D. 169  
 Parmeggiani, P.L. 169  
 Petajan, J. 259  
 Pichotka, J.P. 103, 149  
 Pierau, F.K. 127, 134  
 Rawlins, M.D. 299, 301  
 Reed, E.J. 5  
 Rennie, D.W. 259  
 Robertshaw, D. 261, 263

- oe, C.F. 169  
utherford, S. 237, 247  
ahara, R. 237  
altin, B. 181, 189, 261, 268  
an-Yi, D. 217, 342  
carperi, M. 181, 207, 212  
carperi, S. 181, 207, 212  
chick, J. 169, 346  
schmidt, H.J. 149  
chwennicke, H.P. 149, 156  
lkolnik, A. 103, 115  
imon, E. 217, 219  
lee, J. 65  
nellen, J.W. 261  
teinbach, J. 71  
tevens, J.C. 103, 111  
Stiner, D. 149, 162  
Stolwijk, J.A.J. 181, 201, 261, 268  
Szekerczes, J. 237, 247  
Toivola, P.T.K. 149, 162  
Totel, G.L. 169, 346  
Van Kampen, M. 237, 244  
Várnai, I. 217, 226  
Webb, P. 149, 151  
Weihe, W.H. 103, 356  
Whittow, G.C. 237, 247  
Williams, B.A. 237, 254  
Williams, D.D. 259  
Wright, G. 217  
Wünnenberg, W. 127, 217  
Zeisberger, E. 299, 305

